

ABSTRACT OF THE DISCLOSURE

A technique for bonding soft biological tissue having
25 an incision therein with forceps adapted to grip a portion
of the tissue on both sides of the incision. Electrodes are
secured to the forceps for contacting the tissue portion. An
electrical power source provides a high frequency electrical
signal to the electrodes to be passed through the tissue
30 portion. The electrical power source is controlled to
provide the electrodes with one voltage signal during a
first of two stages, and another voltage signal during a
second of the two stages. During the first stage the
voltage rises linearly. During the second stage, the
35 voltage is stabilized and is modulated with a low frequency
rectangular signal. A clamping means applies force with the
forceps to compress the tissue at one level or at different
levels during two time periods while the high frequency
voltage is passed through the electrodes. The tissue
40 impedance is measured as a function of time, with its
minimal value being determined and stored. At an instant
when the impedance reaches its minimal value, the linear
rise of the high frequency voltage is stopped, and the
voltage is stabilized at the attained level. After that the
45 ratio of the tissue impedance to its minimal value is
determined as a function of time. The passing of the high
frequency voltage to the electrodes is stopped as soon as
such ratio reaches a preset value, which is specific for

each tissu being bonded. The material for making

50 lectrodes is selected so that the electrode may serve as an effective heat sink for conducting heat away from the tissue surface. The electrodes are dimensioned relative to the thickness of tissue in a compressed state.